


## Practice of Instrumentation


PRI

 **Duration**  
5days / 37h


 **Time schedule**  
monday 9 am. - friday 5 pm.

 **Skill level**  
Fundamentals

 **Training objective**  
Acquiring new knowledge

 **Skills assessment method**  
Questionnaire with  
open-ended questions

 **Numbers of Attendees**  
Mini : 4 - Maxi : 10


 **Instructor in charge**  
Philippe TRICHET  
*This training may be run by  
another instructor (see p162)*


 **Sessions & Tuition**  
*Look at our web site :  
[www.ira.eu](http://www.ira.eu)*




*In house sessions can be set-up  
upon request.*

### Additional Information :

 *Senior training instructor,  
recognised as an expert in his field.*

 *By the end of the session, a  
training certificate is delivered with  
an assessment of acquired skills.*

 *Meals in IRA restaurant are  
offered*

### Learning objectives :

- Attendees will acquire the base theory of operation of measuring instruments, control valves, and positioners.
- They will learn how to install, wire, set, tune, maintain and troubleshoot them.

### Prerequisites :

- Knowledge of basic mathematical concepts and physical laws, although not required, would be helpful.

### Course content :

#### INTRODUCTION

- Structure of a basic feedback control loop.
- P&ID's drawing standards.
- Basic electricity, 4 - 20 mA loop.

#### PRESSURE, LEVEL, FLOW & TEMPERATURE MEASUREMENT

- Pressure : Concept, different pressure types, units, sensors, analog electronic and smart transmitters, installation and calibration, pressure switch.
- Level : Indicator, hydrostatic head, capacitive, ultrasonic, nuclear, radar, float, buoyancy, resistive, mechanical type, vibrating blades, rotating paddle).
- Flow : Differential pressure, rotameter, electromagnetic, ultrasonic, turbine, vortex, rotary, Coriolis, thermal, flow indicator and switch.
- Temperature : Thermocouple, resistance temperature detector (RTD), infrared radiation pyrometer.

#### CONTROL VALVES

- Theory of operation, bodies, trim, actuators, flow characteristics, sizing, cavitation, shutoff pressure, leak tightness, calibration.
- Different valve types.
- Control valve positioners.

#### HANDS - ON TRAINING (50%)

- Installing, wiring, setting, checking and troubleshooting various industrial measuring instruments, control valves and positioners.
- Designing and building a complete feedback control loop.

#### NOTE

This training course is part of a two module training package called «PIPC» : Practice of Instrumentation and Process Control, (PPC + PRI).

### Ways and Means :

- The course provides valuable information via lectures on theoretical concepts, backed-up by direct hands-on training in fully equipped classrooms.
- More than 50% of the time is dedicated to actually working on various industrial instruments installed on test benches.
- A knowledge assessment test followed by its proofreading will be run at the end of the training.

### Who should attend ?

Operations and Maintenance Technicians and Engineers, who are new to instrumentation, or who wish to be "cross trained".

### Hands-on Training

